SCIENCE & GOVERNMENT REPORT

11th Year of Publication

The Independent Bulletin of Science Policy

Volume XI, No. 18 | P.O. Box 6226A, Washington, D.C. 20015 | November 1, 1981

Academy Parley Bewails the Budget Crunch

In an extraordinary, day-long community cry last week at the National Academy of Sciences, some 75 barons from the major estates of American science confronted the Reagan Administration's high command for research and, in effect, collectively wailed: Why are you doing this to us?

The highest-ranking respondent, Presidential Science Adviser George A. Keyworth, generally maintained his calm, but did not refrain from openly using the words "panic," "paranoia," and "paranoid" in reference to lamentations about Mr. Reagan's budget proposals for research. The meeting, inspired by the September announcement of a 12-percent across-the-board cut for most federal agencies in the current fiscal year, bore the title, Conference on the Federal R&D Budget for 1982 and Future Years.

Keyworth, who later confided to an aide that he felt "setup" because the Academy hadn't told him that the

AAAS Assails Defense Slurs on Scientific Exchanges—Page 8

reporters would be present, also hit back at the budget complaints with the assertion that rapid growth in the past has led to "continuing tolerance for mediocrity and less emphasis and dedication to excellence."

Next at bat in the proceedings, Fred Khedouri, Associate Director for Natural Resources, Energy, and Science at the Office of Management and Budget, assured the gathered savants that Reaganite budgetmaking is "not a fully irrational process that's sort of floundering about, striking out mindlessly to cut things off." And Khedouri assured them that, compared to the surgery that Reagan has performed on some social programs, basic research "is absolutely flourishing."

The impressario for the event, Academy President Frank Press, who held the presidential science advisory post under Jimmy Carter, launched the meeting, on the morning of October 26, with several lightly veiled allegations of limited smarts in the Reagan Administration's science policymaking.

With physicist Keyworth present there in the venerable Academy—of which, unique among presidential science advisers, Keyworth is not a member—Academy President Press said, "We want to provide the Administration with information about the impact of various courses of action; for example, the budget cuts and how these cuts are allocated."

Continuing in his characteristically mild-mannered and disarming fashion, Press homed in with the announcement that "We want to suggest alternatives for the wise allocation of these resources that would serve to control the damage to the US scientific and technolgical enterprise. I think it is our responsibility to ensure that the process is an informed one, to be sure that we know what the process is and to do what we can to make sure that the judgments are rational and are balanced."

Press added that the meeting was not part of "a lobbying campaign," nor was it intended as forum for debating the Reagan Administration's "overall economic philosophy." But, he said, "if we feel strongly that the proposed budget cuts are wrong, we should say so. On the other hand," he argued, "if we limit ourselves to the issue of reversing the budget cuts, and do not discuss ideas for institutional change...that might make for more effective support of science, I think we're losing an important opportunity."

With the format calling for Keyworth and Khedouri to be followed by research chiefs from most of the government's major science-supporting agencies, Press told the audience that "The government officials that

(Continued on Page 2)

In Brief

The touchy issue of academic salary differentials is rearing up in connection with industry hiring away engineering faculty members with premium salaries. In a talk to the Corporate Associates of the American Institute of Physics, NSF Director John B. Slaughter said that engineering will have to follow law and medicine with competitive pay for teaching.

Slaughter added that the issue arises at a time when "market forces now dictate something close to the poverty line for [liberal arts] instructors and junior faculty."

Looking ahead, the engineer shortage will be the subject of a closed meeting of high-level government, academic, and industrial executives next April at Exxon's New York headquarters. It's billed as an "action conference," designed to get something done about the problem.

The National Science Board has asked OMB to put Mexico in the "domestic" category—same as Canada now is—for travel by researchers. The change would cut a lot of red tape.

...Keyworth: I've Detected Panic, Paranoia

(Continued from Page 1)

are coming here are in a tough spot." And he then went on to suggest that government discipline would restrict their candor. "Most of them come from our own community," he said to the assemblage of university presidents, academic and industrial research directors, and assorted superstars from lab bench. "And we're not privy to the positions they took in internal government debates in that process that is used to arrive at a budget. But as government officials, they will have to show the discipline of essentially supporting the final position of the government and I think we all know that and all know that process."

Following that congenial introduction, Keyworth responded with a brief statement in which he observed that "these are times when there are a lot of questions. I've even detected in my phone conversations panic, if not certainly paranoia."

He then took an upbeat stance, arguing that "science in the United States is healthy today. We are not working from a position of overall retardation. In a sense, I think the reaction in some areas is lacking realism." He then referred to "the penchant for taking the worst possible case that may come out of some very distant, remote rumor mill...."

The Administration's "general philosophy," Keyworth said, aims "more toward the research end and less toward the demonstration end," and he added that "the strength of the science and technology base in this country ultimately comes back to a very heavy reliance on America's top universities...and I think it's an unquestioned area that we must retain strong and even perhaps in some cases restore the critical strength"—Keyworth's first concession at the meeting to the possibility that the national research enterprise is somewhat short of nirvana.

OMB's Khedouri, making a rare public appearance for a budgetman, said that the 12-percent budget cut that was ordered in September for most federal agencies was necessitated by unexpected growth in the deficit. He stuck to the line that a national economic revival would benefit science more than an exemption from the budget-cutting decree, and that research, like all other federally assisted enterprises would, overall, have to contribute a share. But he insisted that the cuts had not been applied indiscriminately, stating that the "Department of Energy's high-energy physics program and the other basic science activities that it conducts have been to some degree insulated from the 12-

(Continued on Page 3)

NAS Urges Major Review

A "consensus statement" calling for trimming development to boost basic research and a comprehensive review of the support of science in the US was the principal product of the Academy's Conference on the Federal R&D Budget for 1982 and Future Years. Following are pertinent sections of the statement:

•

"The proposed reductions in the President's Fall Budget Program would establish an overall percentage cut in all the various budgetary accounts. The conference strongly recommends instead that the Administration and Congress should:

- "View research and development across the entire government, making budgetary adjustments or reductions that maintain the basic sciences by reallocating funds between research and development.
- "Direct a larger part of the increased budget for national security to the funding of basic research that is essential to the maintenance of that security."

In addition, "it is timely to initiate an analysis and evaluation of the institutional system for the support of research and development including the distribution of resources, the continued need for some facilities, grant mechanisms, etc. There should be input into this review from the scientific and engineering communities in universities, the national laboratories and industry. Further, the review must look across Departments and Agencies to achieve the most productive allocation of resources."

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ISSN 0048-9581

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Independently published by *Science & Government Report,* Inc., twice monthly, except once in January, June & July. Annual Subscription: Institutions, $127.50 (two years, $220.00); individuals, $55.00 (two years, $95.00). Editorial offices at 3736 Kanawha St. N.W., Washington, DC 20015. Tel. (202) 244-4135. Second-class postage paid at Washington, DC. Please address all subscription correspondence to Box 6226A, Northwest Station, Washington, DC 20015. Reproduction without permission is prohibited. SGR is available on Xerox University Microfilms. Claims for missing back issues will be filled without charge if made within six months of publication date.

...OMB Aide: Science "Absolutely Flourishing"

(Continued from Page 2)

percent...reduction. We've taken a little more out of some activities that can better absorb it..."—thus contesting the strong suggestion of mindless budget choppers at work.

Khedouri insisted that the Administration's budget planners and science advisers "recognize the importance of science and technology. We plan to try to keep a very strong program, relative to other programs."

And he declared to the anxiety-ridden audience, "I emphasize that it's important to get some perspective on this. If you look at the relative health within the budget of support of science, basic science activities, you'll see it's absolutely flourishing compared to...some social programs...(T)here's not just a nominal dollar growth, there's some real growth in the aggregate, and we intend to try to keep that going, within the extent it's possible, within the overall [budget] targets.

"But we can't assume," the OMB science chief continued, "that, simply having placed a value on this activity, that every penny that we found in the Carter budget for 1982, that every penny that reflects a continuation of an ongoing activity, every proposal that's made by an agency, is intrinsically of great merit simply because it bears the label of basic research.

"We don't wish to engage in qualitative judgments at our level," Khedouri said, referring to OMB, "but we do wish to force the departments to examine very carefully what they're doing, because inevitably, in any program, one can find areas of weakness, one can find better ways to spend money." He added that OMB and the White House science office work together "so that the allocations and the priorities that are established reflect a consensus view."

The two public servants having had their say, the program then called for comments and questions by a five-member panel that was led off by William D. Carey, a long ago Bureau of the Budget research mandarin who holds the post of Executive Officer of the American Association for the Advancement of Science.

As well versed as anyone in the vagaries of federal budgetmaking, Carey expressed a wish for the impossible. The scientific community, he said, "is not asserting any claim on a given share of the government's budget," but, "What we can hold out for is a measure of due process. . . The difficulty is that we do not hear much in any tangible way about government's intentions.

Continuing his battering on the obvious, the AAAS' top hired hand declared, "If OMB sees a world in which crisis budgeting is going to exist in a three-to-five-year environment, then we want to know it, and we need timely notice as to what the fallout on science is likely to be so that something can be done about it with some lead time...[Science needs] an interactive and continuing

(Continued on Page 4)

Through the Budget Fog: An Assessment of R&D Funds

The accompanying tables, prepared for the Academy budget conference by Willis H. Shapley, of the American Association for the Advancement of Science, provide the clearest picture so far—in current and constant dollars—of what everyone agrees is a wondrously confused subject: the federal budget for R&D. "Actual" refers to what really happened in FY 1980. "March" covers the Reagan revisions of the 1982 budget that was inheirited when the new Administration took office, and "Budget '82" is the budget that went into effect October 1, 1982. "Sept. '82" shows the effects of the 12-percent cut ordered by the President, and the final column compares the President's proposed 1982 spending with the 1980 "actual" figure.

Constant 1980 Dollars

(Billions)

	Act. '80	March '81	Budget '82	Sept. '82	Budget '80
DOD	14.02	16.33	18.61	17.73	+26%
NASA	5.24	5.21	5.15	4.85	- 7%
DOE	5.77	5.54	4.65	4.09	- 29%
HHS	3.80	3.75	3.51	3.09	- 19%
NSF	.91	.88	.85	.76	- 17%
Other	3.30	3.15	2.75	2.39	- 28%
Total	33.04	34.86	35.52	32.91	0%
Basic Res	(4.71)	(4.60)	(4.66)	(4.17)	(- 11%)

Current Dollars

(Billions)

	Act. '80	March '81	Budget '82	Sept. '82	Budget '80
DOD	14.02	17.32	22.11	21.06	+50%
NASA	5.24	5.52	6.12	5.76	+18%
DOE	5.77	5.87	5.52	4.86	- 16%
HHS	3.80	3.97	4.17	3.67	- 4%
NSF	.91	.93	1.02	.90	- 1.3%
Other	3.30	3.34	3.26	2.85	- 14%
Total	33.04	36.95	42.20	39.10	18%
Basic Res	(4.71)	(5.01)	(5.54)	(4.96)	(+ 5%)

...Science Shows "Tolerance for Mediocrity"

(Continued from Page 3)

exchange between government and the scientific community so that we can look at the tradeoffs among different strategies for fiscal retrenchment....It is a big number—$40 billion," he noted in reference to the record-breaking sum the feds plan for R&D this year.

Reiterating the theme that mindless budgetmakers are at work in the Reagan Administration, Carey said that "we'd like greater confidence in the procedure that's in place, confidence that it does not constitute more than brute force."

In response, Keyworth said he sympathized with the plea for "timely notice," but added, "Unfortunately, the process of government is in general a very unwieldy one."

Then, addressing the allegations about the quality of the budgetary-decisionmaking process, Keyworth said that he was working hard to institutionalize interactions with the scientific community on scientific priorities. And, in a swipe at the formulation of scientific priorities in past administrations, Keyworth said, "I don't think that is a process that has ever been executed with any great amount of wisdom in this country." As for the R&D budgets for FY 1982 and 1983, Keyworth assured the audience that "I do not think we are projecting calamities or crisis situations." Because the budgeting process is slow, "some decisions have to be made now that represent gambles," he said, in reference to planning of manpower levels for the government's national laboratories. But, he asserted, he was reaching out for advice. "We are not arrogant, we do not think we can make all the decisions." And, in defense of his management of the White House science office, he declared, "I don't think in the past there has been a suitable mechanism" for soliciting the scientific community's advice.

Noting that Carey had used the term "investment protection" in reference to a strategy for supporting R&D, Keyworth said, "To me the scientific and technological base of this country is primarily its talent, and it's that talent that we do wish to protect. That doesn't mean that value judgments about mediocre versus excellent cannot be made....(W)e've never had a clearcut science policy in this country. I, for one, hardly understood what the word 'policy' meant six months ago, but I can see when it doesn't exist."

Keyworth concluded his response with a rather heated assertion: "Things are not out of control. The axe has not half fallen. We are in the midst of the judgment process."

Another panel member, Herbert Simon, Nobel-laureate Professor of Psychology at Carnegie Mellon University, said the question isn't whether "basic science is absolutely starved...but whether investment in basic science" is at a level that makes the "most productive use for our national resources."

OMB's Khedouri replied, first of all, that rather than cuts for basic science, "what we're really talking about is a slight reduction in the rate of growth....This perspective," he said, "is important in order to maintain the proper state of mind about just what is taking place in the sciences."

Then, proceeding with his revelations of thought processes inside the budget bunker, Khedouri said, "We do not want to see an increase...in pressure for the federal government to support more and more scientific endeavor because...that would lead ultimately to an unfortunate loss of independence and politicization....When you look at what is causing the pressure and why there is so much interest...in getting more and more federal support, you find one major factor being the erosion in the position of the universities''' non-government sources of income.

Then came panelists Paul Gray, President of MIT, and W.K.H. Panofsky, Director of the Stanford Linear Accelerator Laboratory, both of whom complained that the year-to-year financial requirements of academe were being dangerously trampled by the turbulence of the federal budgetary process, and that in some bygone 12-year period, things were better.

With the accumulated barbs of the long morning now too much to bear, Keyworth responded that the rapid growth also produced "a continuing tolerance for mediocrity and less emphasis and dedication to excellence." And he continued:

"The concerns that have been expressed to me personally by individuals responsible for institutions are generally concerns that totally isolate by far the worst case imaginable, a case that is so horrible that it never entered my mind, nor did it ever occur in our neck of the woods. Frequently," Keyworth continued, "the [research] agencies are required to represent a [variety] of budgets, and, invariably, the best is never detected, the most likely is rarely discussed, and the pure panic cases [are] the ones that tend to run rampant...."

Then, referring to rumors about the fate of the Department of Energy's research-supporting functions, Keyworth said that they provided "an example of a truly paranoid case." The possibility of DOE's research activities being widely scattered, he said, "came and went in a day [of discussions] some months ago." Nonetheless, he implied, baseless panic persists.

If anything, the Academy meeting simply provided additional fuel for that sense of panic.—DSG

In a Less Clamorous Setting: Keyworth on Policy

Presidential Science Adviser George A. Keyworth used the occasion of his address to the 50th anniversary celebration of the Lawrence Berkeley Laboratory on October 3 for an unusually candid and extensive discussion of science policy, though it remains to be seen whether Keyworth's preference will become Reagan policy. Titled "National Science Policy and the Role of the National Labratories," the complete text is available from: Office of Science and Technology Policy, Executive Office Building, Washington, DC 20500. The following excerpts cover Keyworth's major points:

●

...we must admit at the outset that we have never had a well-defined national science policy. Over the years there have been many discussions of such a policy's putative direction. These discussions were never very conclusive. Often they degenerated into an attempt to establish a certain percentage of GNP for research and development as a substitute for a real policy. Of course, during the limited periods—such as that immediately following Sputnik—we did pursue efforts that momentarily may have given the impression of having such a policy....

Today, we are confronted by realities that force us again to think of the need for a national science policy, but one which is more compelling, and consistent with [current economic] realities.

The climate today is perhaps unique in our history for two reasons. First, as a result of our collective commitment to bringing the focus of our economy back to an emphasis on fiscal responsibility and increased productivity, one must scrutinize every element of the Federal budget, with no exception.

Secondly, following the modern era of technology that dates from the Second World War, the nation is now entering—just as the national labs are—a new era of maturity. It is an era of maturity that requires, among other things, that we ask ourselves: What are the most effective investments that we as a nation can make in science and technology? And, what is the role of government in these investments?

These are the key questions for any national science policy to address, but in a time of severe fiscal constraints they assume dominant significance.

In recognition of these facts, early in my tenure [at an AAAS budget symposium in June] I addressed what I consider the most fundamental element of national science policy; that is, the assessment of priorities, and the establishment of mechanisms by which they can be set and followed.

I soon discovered that this concept was susceptible to broad interpretation. When one talks about priorities in science support there is a tendency on the part of many people to assume that one intends to divide all of science into perhaps a hundred areas and assign them priorities one to one hundred. The problem is further confounded by the conviction that any attempt to predict the importance of a field of scientific research ignores the serendipitous nature of discovery and the impossibility of predicting the precise future benefits of a discovery.

I think these fears are based on a misinterpretation of the type of prioritizing we need. Rather than a "one-to-one-hundred-listing," the type of priority setting I have in mind calls for identifying that perhaps 10 percent of research upon which to put increased emphasis, and an equivalent 10 percent where the effectiveness has not been great over the last ten years....

It seems to me that in setting our priorities in the support of science and technology, we have two bases upon which to define those priorities: excellence and pertinence. The principal criterion for the fundamental pursuit of knowledge must be excellence—excellence in the investigators and excellence in the subject. An additional criterion for the support of areas of research directed toward technology advances is pertinence—and this means pertinence to the recognizable economic and societal needs of the nation.

Admittedly, all these considerations imply value judgments. And value judgments are difficult and fallible—even when they involve a consensus of experts. However, if, as I said before, one concentrates upon emphasizing the most promising avenues, and deemphasizing the least promising, the probability of a large error in judgment is diminished.

My central premise then is simply that we cannot continue to distribute our limited support of research and development without applying stringent and fundamental criteria. This is not just a painful exercise that we in the science and engineering communities have to endure as part of the President's economic recovery plan. It is also good for the future health of American science. As Lord Rutherford once said: "We haven't the money, so we've got to think." I believe that in some respects this philosophy applies today, and it may have many benefits. We cannot substitute thinking alone for money, but we must evaluate more carefully what we do with our resources.

Let me take this matter a step farther. In discussing the idea of pertinence in a recent speech, I stated that the objective was to define areas where America wishes to achieve or maintain preeminence. I then extended this by stating, in effect, that for a number of good reasons we could not expect to be preeminent in all fields....This statement has been interpreted to say: "The President's

(Continued on Page 6)

...Role of National Labs to be Examined

(Continued from Page 5)

Science Advisor Says US Can't Be Number One"....

The idea that we can't be preeminent across the spectrum of science and technology is not a statement of our flagging economy. The fact is that after World War II, America was alone in developing and defining the trends of technology. The rest of the world—with much help from us, we should remember—followed. And in particular Japan and Western Europe have achieved, if not technical parity, technological competitiveness. This is healthy for the world and its stability.

There are certain areas of science and technology that are more pertinent to other countries than to us. But there are also areas where the US is, and shall remain, a leader. I firmly believe that space is one of these. I think that the Shuttle introduced a new capability that will greatly extend US predominance in space. In adapting to the very new capabilities that the Shuttle supplies us in near-earth orbit it does not mean that America's space program is being compromised. To the contrary, it means that an exciting new era is being ushered in where emphasis may go, for example, in astronomy and astrophysics and the space telescope.

There are many other examples, across the spectrum of science and technology, that indicate our preeminance and our competitiveness. They exist in the new biological advances, in chemistry, in computers, in aviation, in materials, in agriculture, and in many other fields. But it is time for the scientific community, as well as for all Americans, to recognize the state of the world today, the new competitiveness, the new realities of the times, and particularly the reality of limited resources—of having to bear, with other sectors of the society, some temporary sacrifices necessary to economic recovery and to a more productive future. That doesn't mean that we can't and shouldn't strive for preeminence. Of course we should. It simply means that we should concentrate our efforts.

In this difficult process the scientific community should bear primary responsibility for establishing its own priorities—something we have not generally been adept at doing in the past.

One exception is a disciplinary area with which you here at LBL are quite familiar, being a pioneer in high-energy physics. I would compliment the high-energy physics community for having demonstrated the ability to examine, realistically and responsibly, the status and direction for high-energy physics in America. I think it has taken as its objective the preservation of the strongest possible high-energy physics program to assure American preeminence in this promising and creative area of science while operating in concert with a strong European effort at CERN.

This latter point brings up the important matter of recognizing both the economic and scientific benefits of cooperation in so called "big science,' and the benefits of scientific exchanges in general.

I consider a major thrust of my tenure at the White House to put international cooperation in science in an appropriate perspective. The scientific community has long realized that science is conducted in the international arena, that one's passport is virtually irrelevant to one's credentials. Governments must also recognize the international nature of science. It is logical for American scientists to do research on foreign facilities, just as it has long been routine for scientists from all over the world to conduct research on US facilities.

Necessarily, we will maintain our leadership role. This implies that we will maintain overall leadership in facilities and we intend to do this. However, a spirit of cooperation rather than competition is consistent with a modern perspective of international science....

The national laboratories must play a major role in influencing the direction of American science, and therefore of science policy. You represent a substantial fraction of our basic research capability and our R&D capability. You possess an enormous wealth of talent. Part of the task that is before you—an important part—is a reexamination of the role that you should play in American science and technology....Now we have to look very carefully at the missions and functions of the labs themselves, particularly in the process of giving sharp focus to national science policy.

In doing this we are faced with problems—problems we should confront together. Two of the most important of these involve a declining quality of life in academia and the related problem of the nation's education and manpower needs in science and technology....

I think that the national laboratories can play a role....A wealth of talent exists in the labs to be used in a number of effective ways. You can serve as new training grounds. You can work more closely with industry and academia to create new programs for manpower planning and supply.

This Administration cannot continue in its budgeting exercise without taking an unprecedented look at the national laboratories and the nation's "return on its investment," as it were, from these institutions. I think that because of my particular function in the White House it will necessarily fall upon me to do this, and we are beginning this initiative now. It is one I most certainly intend to carry out in concert with members of the entire scientific community, including the national labs, academia and industry, because I feel that a three-way perspective is essential.

(Continued on Page 7)

NAS Studying International High-Tech Rivalry

The National Academy of Sciences has appointed an establishment-laden panel on Advanced Technology Competition and the Industrialized Allies to look into what might be done to lessen high-tech cutthroat rivalries between the US and its friends.

NAS President Frank Press referred to the panel in his recent interview with SGR (Vol. XI, No 16), telling us that MIT Chairman Howard W. Johnson would chair the panel. Since then, the Academy has provided details which indicate that the Johnson panel is aiming for an ambitious undertaking that will range from industrial R&D to research in academic settings. The White House Office of Science and Technology Policy has agreed to provide $50,000 for the study, and Press says that funds amounting to several times that sum are being sought from foundations.

The agenda calls for "a series of seminars and working sessions that will begin this fall and extend through 1982," with the aim, as contained in a program statement to: "1) broadly describe trends in high technology industrial development and competition; 2) identify potential sources of conflict among various national policies to support high technology industries; 3) suggest how divergencies may be accommodated and what may be opportunities for consultation and cooperation; and 4) emphasize the importance of bringing the international dimensions of national policies fully into consideration in estimating the costs and benefits of alternative policy decisions. The Review will point up and analyze problems that US policy makers in government, industry, and universities may face in the next two decades with regard to these topics."

The members of the panel are:

Harvey Brooks, Professor of Technology and Public Policy, Harvard

Richard N. Cooper, Professor of Economics, Harvard

Ralph E. Gomory, Vice President for Research, IBM

N. Bruce Hannay, Vice President for Research, Bell Labs

Theodore M. Hesburgh, President, Notre Dame University

William R. Hewlett, Chairman of Executive Committee, Hewlett-Packard

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Robert S. Ingersoll, former US Ambassador to Japan

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Allen E. Puckett, Chief Executive Officer, Hughes Aircraft

David V. Ragone, President, Case Western Reserve University

John S. Reed, Executive Vice President, Citicorp

Walter A. Rosenblith, Institute Professor, MIT

Robert M. Solow, Professor of Economics, MIT

Leonard Woodcock, former US Ambassador to China

POLICY *(Continued from Page 6)*

If all this sounds somewhat foreboding to some of you, I'd like to interject an optimistic note here. The scientific community has historically—and particularly in recent years—had a tendency to overreact to the slightest government examination. And, therefore, I would encourage you not to be looking for disaster around the corner. It won't come.

One reason is that the national labs have earned considerable respect, not only in the scientific community, but in the sponsoring agencies and among legislators. Most importantly, we are convinced that the national laboratory system comprises a resource of enormous value, one whose health is of paramount importance....

Rettig Leaves Rand for Academe

Richard A. Rettig, a Washington-based Rand Corp. analyst long involved in science- and health-policy studies, has been appointed Professor and Chairman of the Department of Social Sciences at the Illinois Institute of Technology, Chicago. Rettig is the author of *Cancer Crusade; The Story of the National Cancer Act of 1971,* and is a member of the National Science Foundation's oversight committee for the *Five-Year Outlook on Science and Technology*.

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AAAS Hits Defense on Scientific Exchanges

The American Association for the Advancement of Science is angrily protesting the Defense Department's contention that the traditional openness of the American scientific community is benefiting Soviet military power.

The spur for the AAAS' ire is that widely discredited polemic, *Soviet Military Power,* a 99-page DoD production which alleges that the Soviets have accumulated an overpowering military advantage.

Under the heading "Technology Transfer," the Defense publication hazily suggests that the advantage has some connection to the paltry Soviet-American programs for scientific and student exchanges. The Soviets, it says, formerly concentrated on "very basic scientific research. Now, nearly all of them propose to study in the emerging scientific fields, with most of these fields having direct and immediate military application."

What this amounts to is an allegation that the American scientific community, in carrying out the traditional practices of international cooperation, has been duped by the Soviets. And that's a bit much, even for the non-combative AAAS. While the AAAS board agreed last week that the DoD contention is offensive and merits a rebuke (yet to come), AAAS Executive Officer William D. Carey, operating on his own, dispatched a stern letter, dated October 9, to Deputy Defense Secretary Carlucci.

"I am dismayed," Carey stated, "to find the Defense Department indicting inter-Academy exchanges, student exchanges, scientific conferences and symposia, and the entire 'professional and open literature' as inherently adverse to US military security interests. These normal and well-accepted fora for advancing scientific progress constitute the primary infrastructure of US and worldwide communication in science," Carey continued, "and without them, the US technology base would go stale very quickly." Carey's letter went on:

"The Defense Department should know, by this time, how scientific practice is conducted and how necessary unimpaired communication in science is to advancing the state of the art and improving our own essential capabilities. I find it deplorable to have our Defense Department taking a public and well-advertised stance that exchanges and the open scientific literature constitute still another window of vulnerability and a free asset handed to our principal adversary.

"It is also somewhat astonishing to have the Defense Department charging that bilateral US-Soviet scientific and technical exchanges are giveaway channels benefiting Soviet military power. These bilateral exchanges, as you must know, are legitimized by formal intergovernmental agreements initiated by President Nixon and continued by his successors. Whether the Defense Department likes them or not, they constitute the present foreign policy of the United States. As to the merits, it is very important to US interests to be well-posted on the quality of Soviet scientific research. The contact we have through the bilaterals has left no doubt as to Soviet excellence in fields that matter to us, including metallurgy, condensed matter physics, theoretical physics, astrophysics, geophysics, and cancer research. Nobody is arguing that the exchanges should involve security-related fields of science. Elsewhere, in fields where both sides are equally good, it is to our country's advantage to pursue the exchanges. The DoD paper shows an extremely disappointing grasp of what the exchanges are all about.

"If I seem exercised by the position taken by the Defense Department in *Soviet Military Power* it is because I *am* exercised. In particular, that position strikes in a deadly way at the dependence of scientific progress on open communication and shared information. Our own military power will be diminished, not enhanced, if the wellheads of scientific communication are sealed and new knowledge confined in silos of secrecy and prior restraint," Carey concluded.

Science & Government Report
Northwest Station
Box 6226A
Washington, D.C. 20015

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